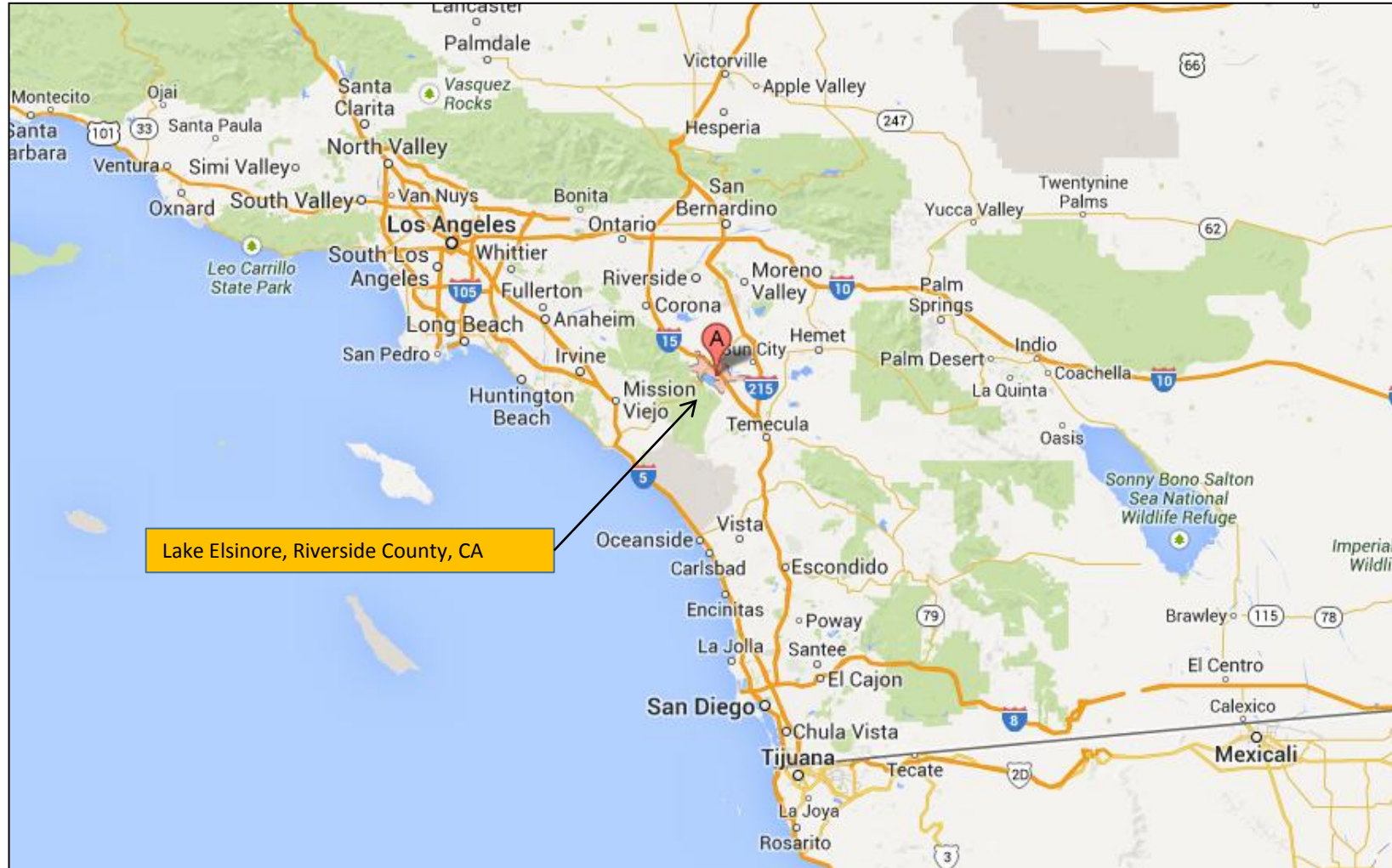




# Case Study: Lake Elsinore, CA

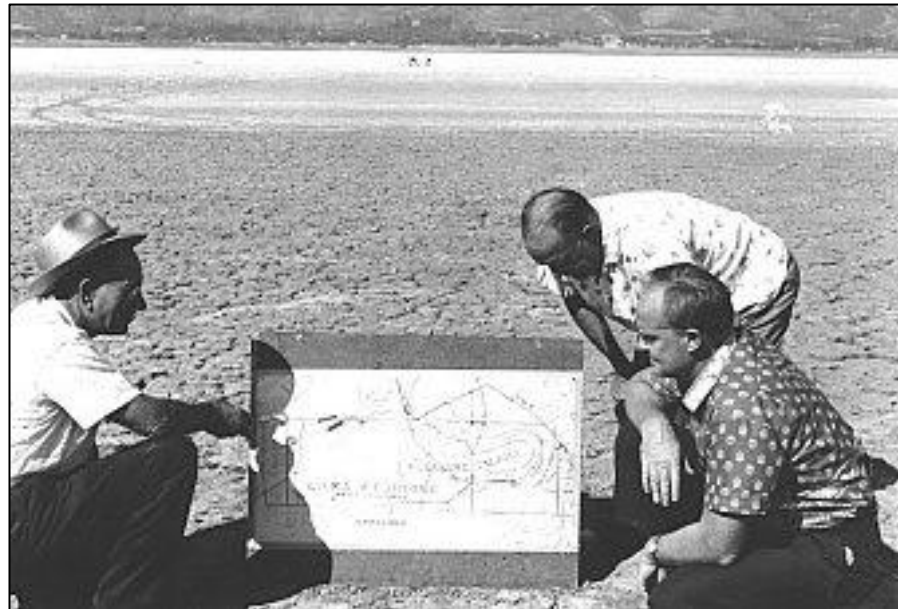


# Lake Elsinore, CA



# Lake Elsinore, CA

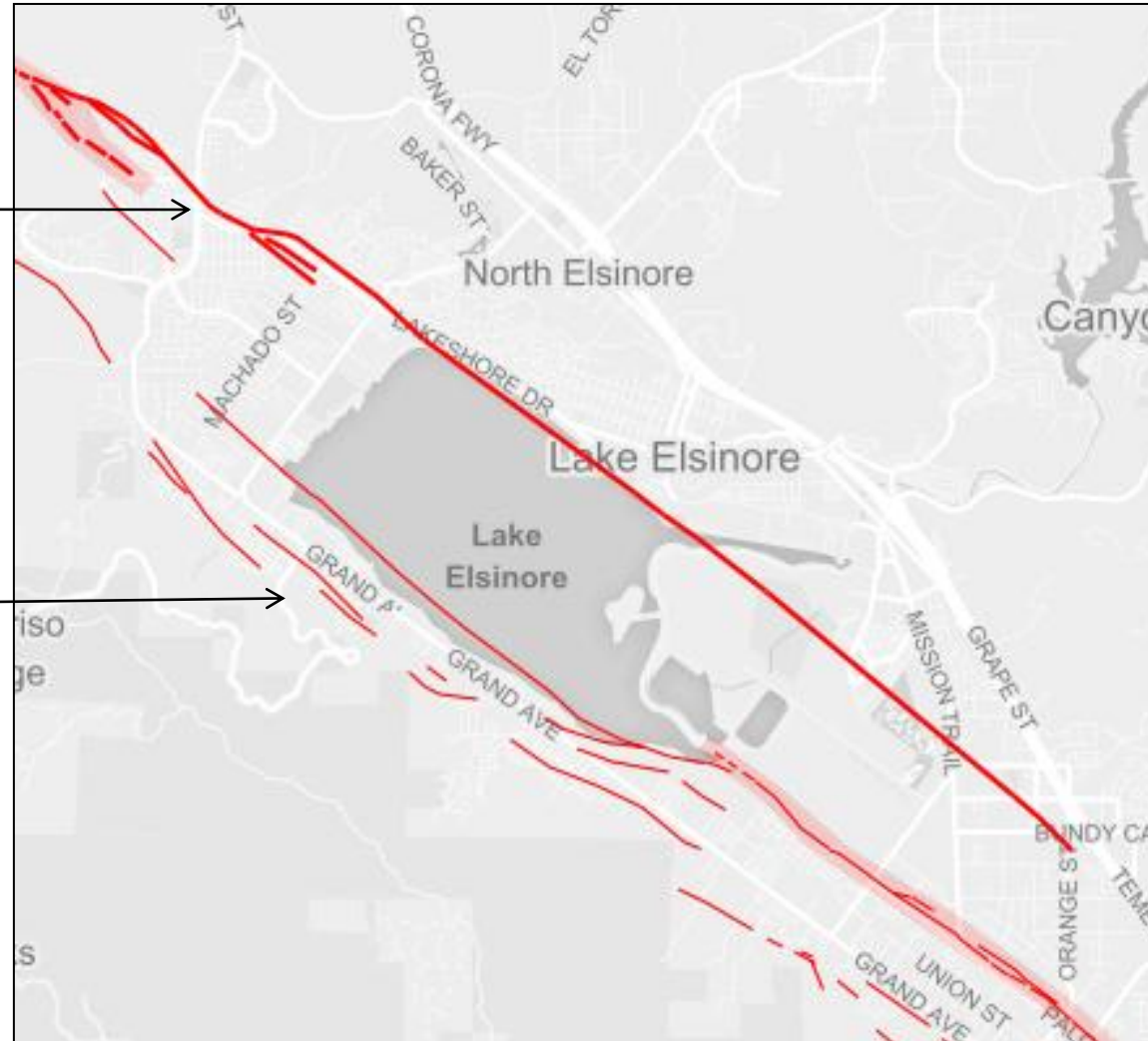
💧 An “extended drought” from 1947 - 1957 left a wind-blown, dusty, dry lake bed in Lake Elsinore, California. Bill Cox, President of the Water for Lake Elsinore Association, joined Director Mathew Yax and Primary Water pioneer Verne L. Cameron, in appraising Cameron's 1962 lake development plan (photo).



# Elsinore Faults

💧 Main Elsinore Fault, parallel to San Jacinto and San Andreas Faults

💧 Parallel faults where Cameron drilled many thermal wells for “hot springs and spas” still in use today, as well as high quality wells



# The Lake Island Wells

- 💧 The first Lake Elsinore Well tested a consistent flow of 5,500 gallons per minute from a deep seated water source. Two nearby wells on same cross-fault also tested to max pump flow over 5000 gpm; along with limited rainfall and flood runoff, combined to produce a stabilized lake approximately 3 miles long and 1.5 miles wide.



# Lake Elsinore Restored

💧 The Lake Elsinore was fully restored due to the innovative work and skill of Verne Cameron and Bill Cox.



# Lake Elsinore Today

- 💧 Lake Elsinore, California survives today thanks to the primary water wells sited and drilled over 50 years ago!



# Lake Elsinore's "Island Wells"





# Island Wells: Middle Well 1965 WQR

## Water Quality Report

Station Name: <a href="#">06S04W18G002S</a>			Station Number: 06S04W18G002S		
Collection Date: 12/13/1965 00:00			Sample Code: WDIS_0847852		
Depth: Feet Matrix: Water, Natural		Purpose: Normal Sample Sample Parent: 0			
Description: Historic WDIS Database - Agency*: DWR - Lab: DWR / Est. R.L.					
Analyte	Result	Rpt Limit	Units	Method [*]	
Total Alkalinity	95	1	mg/L as CaCO3	EPA 310.1 [1]	
Dissolved Boron	0.18	0.1	mg/L	Std Method 4500-B, C [1]	
Dissolved Calcium	6	1	mg/L	EPA 215.2 [1]	
Dissolved Chloride	53	0.1	mg/L	Std Method 4500-Cl, B [1]	
Conductance	552	1	µS/cm	EPA 120.1 [1]	
Dissolved Fluoride	0.7	0.1	mg/L	Std Method 10th Ed Fluoride [1]	
Total Hardness	15	1	mg/L as CaCO3	EPA 130.2 [1]	
Dissolved Magnesium	< R.L.	0.1	mg/L	Std Method 3500-Mg, E [1]	
Dissolved Nitrate	2	0.1	mg/L	Std Method 12th Ed Nitrate [P/A]	
Dissolved Potassium	< R.L.	0.1	mg/L	Std Method 3500-K, D [1]	
Dissolved Sodium	110	1	mg/L	Std Method 3500-Na, D [1]	
Total Dissolved Solids	311	1	mg/L at 180°C	EPA 160.1 [1]	
Dissolved Sulfate	81	1	mg/L	EPA 375.3 [1]	
pH	9.1	0.1	pH Units	EPA 150.1 [1]	



# Island Wells: Middle Well 1975 WQR

## Water Quality Report

Station Name: <a href="#">06S04W18G001S</a>			Station Number: 06S04W18G001S	
Collection Date: 10/31/1975 10:40			Sample Code: WDIS_0848000	
Depth: Feet Matrix: Water, Natural		Purpose: Normal Sample Sample Parent: 0		
Description: Historic WDIS Database - Agency: DWR - Lab: Non-DWR				
Analyte	Result	Rpt Limit	Units	Method [1]
Total Alkalinity	119	1	mg/L as CaCO3	EPA 310.1 [1]
Dissolved Boron	0.15	0.1	mg/L	Std Method 4500-B, C [1]
Dissolved Calcium	9.6	1	mg/L	EPA 215.1 [1]
Dissolved Chloride	83	0.1	mg/L	Std Method 4500-Cl, B [1]
Conductance	704	1	µS/cm	EPA 120.1 [1]
Dissolved Fluoride	0.8	0.1	mg/L	Std Method 12th Ed Fluoride [1]
Total Hardness	26	1	mg/L as CaCO3	EPA 130.2 [1]
Dissolved Magnesium	0.5	0.1	mg/L	EPA 242.1 [1]
Dissolved Nitrate	3.1	0.1	mg/L	EPA 352.1 (DWR Modified) [P/A]
Dissolved Potassium	1.2	0.1	mg/L	EPA 258.1 [1]
Dissolved Sodium	137	1	mg/L	EPA 273.1 [1]
Total Dissolved Solids	382	1	mg/L at 180°C	EPA 160.1 [1]
Dissolved Sulfate	86	1	mg/L	EPA 375.3 [1]
pH	8.3	0.1	pH Units	EPA 150.1 [1]
Field Result(s):				
Water Temperature	28	0.1	°C	EPA 170.1 (Field) [1]



# Island Wells: South Well 1975 WQR

## Water Quality Report

Station Name: <a href="#">06S04W18K001S</a>			Station Number: 06S04W18K001S	
Collection Date: 10/31/1975 10:20			Sample Code: WDIS_0848001	
Depth: Feet Matrix: Water, Natural		Purpose: Normal Sample Sample Parent: 0		
Description: Historic WDIS Database - Agency: DWR - Lab: Non-DWR				
Analyte	Result	Rpt Limit	Units	Method [*]
Total Alkalinity	124	1	mg/L as CaCO3	EPA 310.1 [1]
Dissolved Boron	0.11	0.1	mg/L	Std Method 4500-B, C [1]
Dissolved Calcium	10	1	mg/L	EPA 215.1 [1]
Dissolved Chloride	73	0.1	mg/L	Std Method 4500-Cl, B [1]
Conductance	630	1	µS/cm	EPA 120.1 [1]
Dissolved Fluoride	0.8	0.1	mg/L	Std Method 12th Ed Fluoride [1]
Total Hardness	26	1	mg/L as CaCO3	EPA 130.2 [1]
Dissolved Magnesium	< R.L.	0.1	mg/L	EPA 242.1 [1]
Dissolved Nitrate	0.5	0.1	mg/L	EPA 352.1 (DWR Modified) [P/A]
Dissolved Potassium	0.8	0.1	mg/L	EPA 258.1 [1]
Dissolved Sodium	124	1	mg/L	EPA 273.1 [1]
Total Dissolved Solids	339	1	mg/L at 180°C	EPA 160.1 [1]
Dissolved Sulfate	66	1	mg/L	EPA 375.3 [1]
pH	8.7	0.1	pH Units	EPA 150.1 [1]
Field Result(s):				
Water Temperature	28	0.1	°C	EPA 170.1 (Field) [1]



# Island Wells: North Well 1977

## Water Quality Report

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Station Name: <a href="#">06S04W18B001S</a>		Station Number: 06S04W18B001S		
Collection Date: 01/21/1977 12:30		Sample Code: WDIS_0404244		
Depth: Feet Matrix: Water, Natural		Purpose: Normal Sample Sample Parent: 0		
Description: Historic WDIS Database - Agency: DWR - Lab: DWR				
Analyte	Result	Rpt Limit	Units	Method [*]
Dissolved Ortho-phosphate	0.08	0.01	mg/L as P	Std Method 4500-P, D [1]
Total Phosphorus	0.15	0.01	mg/L as P	Std Method 4500-P, D [1]
Field Result(s):				
Conductance	690	1	µS/cm	Std Method 2510-B (Field) [1]
Water Temperature	93	0.1	°F	EPA 170.1 (Field) [1]
pH	8.4	0.1	pH Units	UnkH pH [UnkH]



# The Lake Island Wells Today

💧 Three wells drilled in a line along a structure perpendicular to the Elsinore Fault to a depth of 1200-1400 ft, TDS < 500 ppm

💧 Drilled in 1965, inundated in 1980...**refurbished in 2004!**



# Lake Elsinore's Island Wells 50+ Years

- 💧 Lake Elsinore is stabilized today by one billion gallons per year (~2000 gpm) from the Primary Water wells sited and drilled 50 years ago!



<http://www.utsandiego.com/news/2010/Oct/18/forum-lake-elsinore-a-success/>

“To help stabilize lake levels at Lake Elsinore, the authority restored three groundwater wells that provide **more than a billion gallons of groundwater annually** through the Lake Elsinore Island Wells Project.” – 2010

